

## 0.a. Goal

Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

## 0.b. Target

Target 9.b: Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities

## 0.c. Indicator

Indicator 9.b.1: Proportion of medium and high-tech industry value added in total value added

## 0.e. Metadata update

February 2021

## 0.g. International organisations(s) responsible for global monitoring

United Nations Industrial Development Organization (UNIDO)

## 1.a. Organisation

United Nations Industrial Development Organization (UNIDO)

## 2.a. Definition and concepts

Definitions:

The proportion of medium-high and high-tech industry (MHT hereafter) value added in total value added of manufacturing (MVA hereafter) is a ratio value between the value added of MHT industry and MVA.

Concepts:

The value added of an industry (industry value added) is a survey concept that refers to the given industry's net output derived from the difference of gross output and intermediate consumption. Manufacturing sector is defined according to the International Standard Industrial Classification of all Economic Activities (ISIC) Revision 3 (1990) or Revision 4 (2008). It refers to industries belonging to sector D in revision 3 or sector C in Revision 4.

Technology classification is based on research and development (R&D) expenditure relative to value added otherwise referred as R&D intensity. Data for R&D intensity are presented in a report (Galindo-Rueda and Verger, 2016) published by the OECD in 2016, which also proposes a taxonomy for industry groups with different ranges of R&D expenditure relative to their gross value added. MHT industries have traditionally been defined exclusively to manufacturing industries. However, there have been recent efforts (Galindo-Rueda and Verger, 2016) to extend the definition to non-manufacturing industries as well. Nevertheless, medium-high and high technology sectors also in new paper are primarily represented by manufacturing industries.

The following table includes the classification of MHT industries by ISIC Rev. 3 and ISIC Rev. 4.

| ISIC Rev.4 | Description                                                                  | ISIC Rev.3 | Description                                                                   |
|------------|------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------|
| 20         | Manufacture of chemicals and chemical products                               | 24         | Manufacture of chemicals and chemical products                                |
| 21         | Manufacture of basic pharmaceutical products and pharmaceutical preparations | 29         | Manufacture of machinery and equipment n.e.c.                                 |
| 252        | Manufacture of weapons and ammunition                                        | 30         | Manufacture of office, accounting and computing machinery                     |
| 26         | Manufacture of computer, electronic and optical products                     | 31         | Manufacture of electrical machinery and apparatus n.e.c.                      |
| 27         | Manufacture of electrical equipment                                          | 32         | Manufacture of radio, television and communication equipment and apparatus    |
| 28         | Manufacture of machinery and equipment n.e.c.                                | 33         | Manufacture of medical, precision and optical instruments, watches and clocks |
| 29         | Manufacture of motor vehicles, trailers and semi-trailers                    | 34         | Manufacture of motor vehicles, trailers and semi-trailers                     |
| 30*        | Manufacture of other transport                                               | 35**       | Manufacture of other transport                                                |

|     |                                                            |  |           |
|-----|------------------------------------------------------------|--|-----------|
|     | equipment                                                  |  | equipment |
| 325 | Manufacture of medical and dental instruments and supplies |  |           |

\* Excluding 301 (Building of ships and boats)

\*\* Excluding 351 (Building and repairing of ships and boats)

MVA is the value added of manufacturing industry, which is Section C of ISIC Rev.4, and Section D of ISIC Rev.3.

## 2.b. Unit of measure

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Percentages

## 2.c. Classifications

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[International Standard Industrial Classification of all Economic Activities \(ISIC\) Revision 4](#)

[International Standard Industrial Classification of all Economic Activities \(ISIC\) Revision 3](#)

## 3.a. Data sources

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Data can be found in UNIDO INDSTAT4 Database by ISIC Revision 3 and ISIC Revision 4 respectively.

## 3.b. Data collection method

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Data are collected using General Industrial Statistics Questionnaire which is filled by NSOs and submitted to UNIDO annually. Data for OECD countries are obtained directly from OECD. Country data are also collected from official publications and official web-sites.

## 3.c. Data collection calendar

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Data are collected annually from NSOs and OECD

## 3.d. Data release calendar

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UNIDO INDSTAT database is updated between March and April every year.

## 3.e. Data providers

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National statistical offices (NSOs) in non-OECD countries, and OECD countries by OECD

### 3.f. Data compilers

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United Nations Industrial Development Organization (UNIDO)

### 3.g. Institutional mandate

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UNIDO, as the specialized UN agency on industrial development, has the international mandate for collecting, producing and disseminating internationally comparable industrial statistics. UNIDO's mandate covers (i) the maintenance and updating of international industrial statistics databases; (ii) methodological and analytical products based on statistical research and experience of maintaining internationally comparable statistics; (iii) contributions to the development and implementation of international statistical standards and methodology; and (iv) technical cooperation services to countries in the field of industrial statistics. With the repositioning of UNIDO as the focal agency for inclusive and sustainable industrial development (ISID), its statistical mandate was expanded to cover all dimensions of industrial development, including its inclusiveness and environmental sustainability.

### 4.a. Rationale

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Industrial development generally entails a structural transition from resource-based and low technology activities to MHT activities. A modern, highly complex production structure offers better opportunities for skills development and technological innovation. MHT activities are also the high value addition industries of manufacturing with higher technological intensity and labour productivity. Increasing the share of MHT sectors also reflects the impact of innovation.

### 4.b. Comment and limitations

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Value added by economic activity should be reported at least at 3-digit ISIC for compiling MHT values.

### 4.c. Method of computation

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The indicator is calculated as the share of the sum of the value added from MHT economic activities to MVA.

$$\frac{\text{Sum of value added in MHT economic activities}}{\text{MVA}} * 100$$

### 4.d. Validation

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UNIDO engages with countries in regular consultations during the data collection process to ensure the data quality and international comparability.

## 4.e. Adjustments

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Data are collected through the UNIDO General Industrial Statistics Questionnaire to receive information on differences in concept, scope, coverage and classification used. The final data are adjusted to follow ISIC and facilitate international comparability.

## 4.f. Treatment of missing values (i) at country level and (ii) at regional level

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- At country level:

Missing values are imputed based on the methodology from Competitive Industrial Performance Report (UNIDO, 2016).

- At regional and global levels:

Imputation applied at country level.

## 4.g. Regional aggregations

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Regional and global aggregates are calculated as a weighted average of countries' MHT shares in a group. Weights are taken based on the MVA share in a group (UNIDO MVA Database).

## 4.h. Methods and guidance available to countries for the compilation of the data at the national level

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International Recommendations for Industrial Statistics (IRIS) 2008

[https://unstats.un.org/unsd/publication/seriesM/seriesm\\_90e.pdf](https://unstats.un.org/unsd/publication/seriesM/seriesm_90e.pdf)

International Standard Industrial Classification of All Economic Activities (ISIC)

<https://unstats.un.org/unsd/classifications/Econ/isic>

## 4.j. Quality assurance

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The UNIDO quality assurance framework is followed to check data quality and consistency before the data dissemination.

UNIDO (2009), UNIDO Data Quality: A quality assurance framework for UNIDO statistical activities <https://open.unido.org/api/documents/4814740/download/UNIDO-Publication-2009-4814740>

## 5. Data availability and disaggregation

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Data availability:

More than 150 economies

Time series:

Data for this indicator are available from 2000 in the UN Global SDG Database, but longer time series are available in the CIP database.

Disaggregation:

No disaggregation available.

## 6. Comparability/deviation from international standards

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Sources of discrepancies:

Conversion to USD or difference in ISIC combinations may cause discrepancy between national and international figures.

## 7. References and Documentation

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**URL:**

[www.unido.org/statistics](http://www.unido.org/statistics)

<https://stat.unido.org/>

**References:**

UNIDO Publication - The Industrial Competitiveness of Nations 2013

Competitive Industrial Performance (CIP) report 2018

International Standard Industrial Classification of All Economic Activities 2008

Galindo-Rueda, F. and F. Verger (2016). OECD Taxonomy of Economic Activities Based on R&D Intensity, OECD Science, Technology and Industry Working Papers, 2016/04, OECD Publishing, Paris. Available at:

<http://dx.doi.org/10.1787/5jlv73sqqp8r-en>